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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Minh-Tan Ton-That et al.

Serial No.: 10/617,185

Filed: 07/11/2003

Title: CELLULOSE FILLED THERMOPLASTIC COMPOSITES

Art unit: 1711

Examiner: Umakant K. Rajguru

Attorney Docket No.: 942079

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Declaration Under 37 C.F.R. 1.132 Of Minh-Tan Ton-That

Honorable Commissioner of Patents and Trademarks

Washington, D, C. 20231

Sir:

Minh-Tan Ton-That declares that:

1. He is a co-inventor of and is familiar with the present U.S. patent application Serial No. 10/617,185 filed July 11, 2003 in the name of Minh-Tan Ton-That et al. and entitled CELLULOSE FILLED THERMOPLASTIC COMPOSITES and is familiar with the Official Actions dated May 12, 2005 and March 2, 2005 issued therein and with the prior art references cited in the Official Action, including U.S. patent 6,066,278 (Got et al.), U.S. patent 4,755,553 (Kishimura et al.), U.S. patent 4,323,625 (Coran et al.) and U.S. patent 5,134,179 (Felegi Jr. et al.)

2. He received a Doctorate degree in Natural Science (Theoretical Chemistry) from the University of Innsbruck, Austria, in 1996. From 1996-1998 he was a postdoctoral fellow at the German Plastic Institute at the Technical University of Darmstadt, Germany. In 1998 he was employed as a Postdoctoral Fellow at the University of Sherbrooke, Canada. From 1998 to now he has been employed as a Research Associate and Research Officer at the Industrial Materials Institute at the National Research Council of Canada in Boucherville, Canada. From 2000 to now he has been affiliated as an Adjunct Associate Professor with the Department of Mechanical and Industrial Engineering at Concordia University in Montreal, Canada. His primary area of expertise comprises processing, formulation, characterization

and process control of polymer and polymeric composite materials. He is a co-inventor of 8 patent applications and has authored or co-authored over 75 publications in the field of polymer and polymeric composite materials, including fiber-filled polymeric composites.

3. Under his direction and control, five compositions were formulated having chemical compositions as listed in Table A.

Table A

Sample	Basic Reactive Filler	Cellulosic Filler	Graft Polyolefin	Polypropylene
	CaO (wt%)	Pine sawdust (wt%)	Epolene-43 (wt%)	Profax 1274 (wt%)
A	0	40	2	balance
B	3	40	2	balance
S	8	40	2	balance
T	15	40	2	balance
U	20	40	2	balance

Sample A is a Control having no CaO. Sample B utilizes an amount of CaO representative of the compositions disclosed in U.S. patent 6,066,278 (Got et al.), particularly as described in the example at col. 7, lines 25-35 of Got et al. Samples S, T and U utilize an amount of CaO representative of the compositions disclosed and claimed in the present application. The Samples were all formulated as described in the present specification on page 11.

For each sample, the following mechanical properties were measured:

Young Modulus using ASTM D-638

Tensile strength using ASTM D-638

Notched Charpy Impact Strength using ASTM D-6110

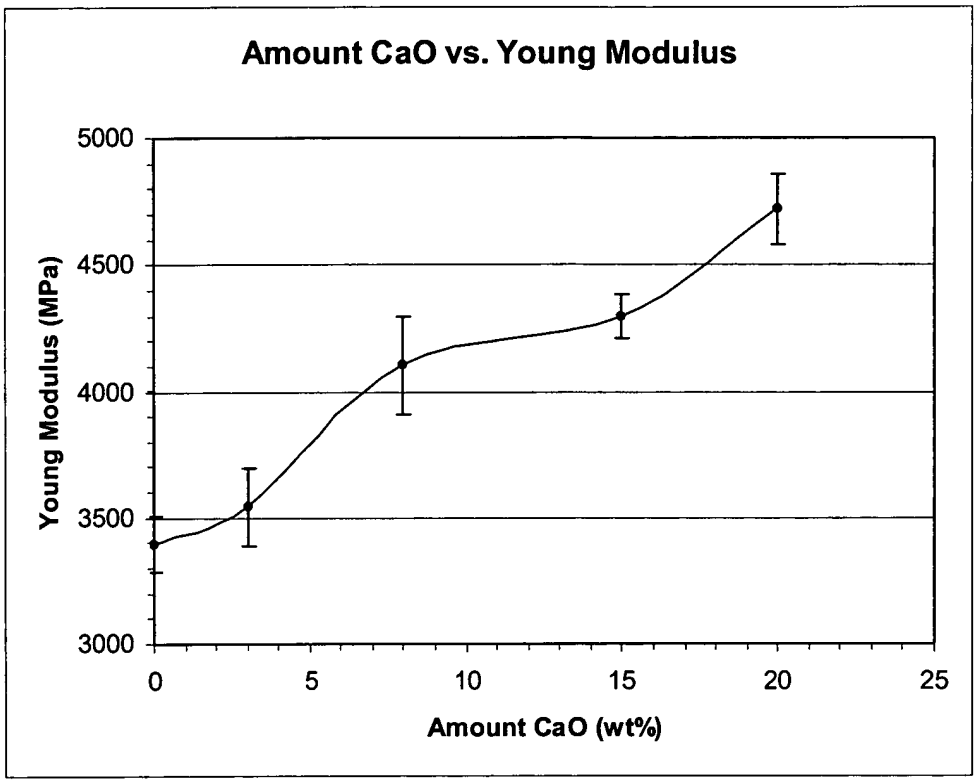
Un-notched Izod Impact Strength using ASTM D-256

The numerical results are listed in Table B.

Table B

Sample	Young Modulus (MPa)	Tensile Strength (MPa)	Charpy Impact (J/m)	Izod Impact (J/m)
A	3398 ± 110	31.9 ± 0.1	35 ± 6	144 ± 12
B	3543 ± 153	30.6 ± 0.2	39 ± 4	133 ± 10
S	4106 ± 194	29.9 ± 0.2	34 ± 3	112 ± 10
T	4297 ± 90	31.1 ± 0.1	33 ± 2	114 ± 7
U	4720 ±140	30.4 ± 0.1	28 ± 3	98 ± 9

The results for Young Modulus are graphically represented in the following graph:



4. The values for the mechanical properties for Sample A in Table B are the values for a composition having no basic reactive filler. Sample A provides Control values for comparing the mechanical properties of compositions of Got et al. as represented by Sample B to compositions of the present invention as represented by Samples S, T and U.

It is apparent from the graph that an initial rapid increase in Young Modulus occurs in compositions having an amount of CaO between about 3 wt% CaO and 8 wt% CaO, after which the Young Modulus continues to increase in compositions having an amount of CaO up to 20 wt% CaO. Such an initial rapid increase in the Young Modulus and the continued increase in Young Modulus is unexpected, especially since Got et al. suggest that higher amounts of CaO should reduce mechanical properties.

Sample B (representative of Got et al.) having a Young Modulus of about 3543 MPa provides an increase in Young Modulus of only about 4.3% over Control Sample A having a Young Modulus of about 3398 MPa. On the other hand Sample S having a Young modulus of about 4106 MPa provides an increase in Young Modulus of about 20% over Control Sample A having a Young Modulus of about 3398 MPa. Values of Young Modulus greater than or equal to about a 20% increase over the Control value are considered characteristic of the present invention.

The data for tensile strength, Charpy impact strength and Izod impact strength illustrate that other mechanical properties of the composition are not unduly affected

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by an increase in CaO up to at least 20 wt% CaO. There is a small decrease in Izod impact strength at 20 wt% CaO, however, within experimental error, the Charpy impact strength is the same between all of the samples. Therefore, the unexpected increase in Young Modulus at higher CaO content is not at the expense of other mechanical properties.

5. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Dr. Minh-Tan Ton-That

Date: 2005-06-21